

# Notice of Allowability

Application No.

09/921,695

Examiner

Rip A. Lee

Applicant(s)

BRITOVSEK ET AL.

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to September 19, 2005.
2. ☒ The allowed claim(s) is/are 2,3,8-19 and 24-64.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

***Allowable Subject Matter***

The following is an examiner's statement of reasons for allowance: Claims 2, 3, 8-19, 24-64 are allowed over the closest references cited below.

The present invention, as generally described in independent claim 2, is drawn to a composition comprising a plurality of alkyl zinc compounds and a group 3-10/lanthanide/actinide complex, wherein the mole ratio of the complex to the plurality of zinc alkyl compounds in the composition is in the range of from about 1:10,000,000 to about 1:100, and wherein the alkyl groups of the plurality of zinc alkyl compounds follow a Poisson distribution of chain lengths up to about 200 carbon atoms or a Schulz-Flory distribution of chain lengths up to about 50,000 carbon atoms.

Another aspect of the invention is a process for the preparation of zinc alkyl chain growth products or alpha olefins comprising contacting an alpha olefin and zinc alkyl compound with a chain growth catalyst system which employs a group 3-10/lanthanide/actinide metal complex to form a zinc alkyl chain growth product, followed by olefin displacement of the grown alkyl as alpha olefin from the zinc alkyl chain growth product wherein the mole ratio of the complex in the catalyst system to the zinc alkyl compound is in the range of from about 1:10,000,000 to about 1:100. Independent claims 44, 46-49, 53-60, 63, and 64 recite the specific types of chain growth catalyst system which is used in the chain growth product or alpha olefin processes.

A further embodiment of the invention (independent claim 3) is a process for the preparation of primary alcohols comprising contacting an alpha olefin and zinc alkyl compound with a chain growth catalyst system to form a zinc alkyl chain growth product, followed by oxidation of the zinc alkyl chain growth product to form alkoxide compounds, followed by hydrolysis of the alkoxide compounds to produce primary alcohols.

Young *et al.* (U.S. 5,449,850) discloses a catalyst system containing a group 4 transition metal and a second catalyst component such as  $R_2Zn$  wherein R is a  $C_1$ - $C_{20}$  alkyl. A process in which  $C_3$  and higher alpha-olefins are contacted with the catalyst is described. Products are used as feedstocks for further processes such as hydroformylation and hydrogenation to make high molecular weight alcohols. The mole ratio of alkyl metal to transition metal is about 15:1 to 3:1, and this lies outside the range set forth in the instant claims. One of ordinary skill in the art would not have found it obvious to modify the invention of Young *et al.* in order to arrive at the subject of the instant claims. Additionally, Young *et al.* does not set forth the steps recited in the claims for making primary alcohols.

Mathys (WO 91/02707) teaches a process for making alpha-olefin oligomers by contacting ethylene with a catalyst containing a group 4 transition metal and a second catalyst component such as  $R_2Zn$  wherein R is a  $C_1$ - $C_{20}$  alkyl. The ratio of the second component to the first (group 4 metal) component is 1:1 to 50:1, and this lies outside the range set forth in the instant claims. One of ordinary skill in the art would not have found it obvious to modify the invention of Mathys in order to arrive at the subject of the instant claims. The patent does not teach manufacture of primary alcohols.

Langer *et al.* (U.S. 4,361,714) teaches a process in which ethylene is contacted with  $ZrCl_4$  and an alkyl zinc compound such as dimethylzinc, diethylzinc, dibenzylzinc, and dicyclohexylzinc. The product is linear alpha olefins having a number average molecular weight in the range of 200-700, and the products follow a Flory distribution. The mole ratio of zinc component to transition metal is 0.1/1 to 0.5/1, and this lies outside the range set forth in the instant claims. One of ordinary skill in the art would not have found it obvious to modify the invention of Langer *et al.* in order to arrive at the subject of the instant claims. The patent does not teach manufacture of primary alcohols.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

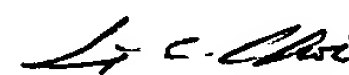
Art Unit: 1713

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

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December 11, 2005



LING-SUI CHOI  
PRIMARY EXAMINER